What is claimed is:

1. A cabled conductor comprising a plurality of transposed strands each comprising one or more filaments comprising grains of textured anisotropic superconducting compounds which have crystallographic grain alignment that is substantially unidirectional and directionally independent of the rotational orientation of the strands and filaments in the cabled conductor.

2. A cabled conductor comprising a plurality of strands transposed about the longitudinal axis of the conductor, each strand comprising one or more filaments comprising grains of an anisotropic superconducting compound textured such that the crystallographic c axis alignment of each grain of the superconducting compound is substantially perpendicular to the longitudinal axis of the cabled conductor, independent of the rotational orientation of the strands and filaments in the cabled conductor.

3. A cabled conductor according to claim 2 wherein each strand further comprises a conductive matrix material surrounding or supporting the filaments.

4. A cabled conductor according to claim 2 wherein the anisotropic superconducting compound is a superconducting ceramic.

5. A cabled conductor according to claim 4 wherein the superconducting ceramic material comprises a superconducting oxide.

6. A cabled conductor according to claim 2 wherein each strand is insulated.

7. A cabled conductor according to claim 2 wherein each filament is twisted.

8. A cabled conductor according to claim 7 wherein each strand has a preselected strand lay pitch and each filament has a preselected filament cross-section and filament twist pitch, and the strand lay pitch, filament cross-section and filament twist pitch being cooperatively selected to provide a filament transposition area which is always at least ten times the preferred direction area of a typical grain of the desired anisotropic superconducting compound.

9. A cabled conductor according to claim 8 wherein the strand lay pitch, filament cross-section and filament twist pitch are cooperatively selected to provide a filament transposition area which is always at least thirty times the preferred direction area of a typical grain of the desired anisotropic superconducting compound.

10. A cabled conductor according to claim 5 wherein the superconducting ceramic is micaceous or semi-micaceous.

11. A cabled conductor according to claim 10 wherein the superconducting ceramic is a member of the bismuth family of superconducting oxides.

12. A cabled conductor according to claim 11 wherein the filaments are twisted and the filament cross-section, filament twist pitch, and strand lay pitch are cooperatively selected so that at each point on the filament, regardless of how it is twisted, the filament width in the plane of the widest longitudinal cross-section of the conductor is always greater than, and preferably twice as large as the filament height orthogonal to the widest longitudinal cross-section of the conductor.

13. A cabled conductor according to claim 11 wherein the superconducting ceramic is BSCCO 2212.

14. A cabled conductor according to claim 11 wherein the superconducting ceramic is BSCCO 2223.

15. A cabled conductor according to claim 10 wherein the superconducting ceramic is a member of the thallium family of superconducting oxides.

16. A cabled conductor according to claim 5 wherein the superconducting ceramic is a member of the rare earth family of superconducting oxides.

17. A cabled conductor according to claim 16 wherein the cabled conductor is a Litz cable.

18. A cabled conductor according to claim 17 wherein the cable is a Rutherford cable.

19. A cabled conductor according to claim 17 wherein the cable is a Roebel cable.

20. A cabled conductor according to claim 17 wherein the cable is a braided cable.

21. A cabled conductor according to claim 16 wherein the strands are only partly transposed.

22. A method for manufacturing a superconducting cabled conductor comprising the steps of:

forming a plurality of composite strands, each strand comprising at least one filament having a preselected filament cross-section and containing grains of a desired anisotropic superconducting compound or its precursors;

forming a cabled intermediate from the strands by transposing them about the longitudinal axis of the conductor at a preselected strand lay pitch, and, texturing the strands in one or more steps including at least one step involving application of a texturing process with a primary component directed orthogonal to the widest longitudinal cross-section of the cabled intermediate, and if a precursor to the desired superconducting compound remains, at least one thermomechanical processing step at conditions sufficient to produce phase transformation in the filament material, at least one such orthogonal texturing step occurring subsequent to said strand transposition step; thereby forming a superconducting cabled conductor having a crystallographic grain alignment substantially independent of the rotational orientation of the strands and filaments in the cabled conductor.

23. A method for manufacturing a superconducting cabled conductor according to claim 22 wherein each strand further comprises a conductive matrix material surrounding or supporting the filaments.

24. A method for manufacturing a superconducting cabled conductor according to claim 22 wherein the anisotropic superconducting compound is a superconducting ceramic.

25. A method for manufacturing a superconducting cabled conductor according to claim 24 wherein the superconducting ceramic material comprises a superconducting oxide.

26. A method for manufacturing a superconducting cabled conductor according to claim 22 wherein the filaments are twisted to a predetermined twist pitch.

27. A method for manufacturing a superconducting cabled conductor according to claim 26 wherein the strand lay pitch, filament cross-section and filament twist pitch are cooperatively selected to provide a filament transposition area which is always at least ten times the preferred direction area of a typical grain of the desired anisotropic superconducting compound.

28. A method for manufacturing a superconducting cabled conductor according to claim 27 wherein the strand lay pitch, filament cross-section and filament twist pitch are cooperatively selected to provide a filament transposition area which is always at least thirty times the preferred direction area of a typical grain of the desired anisotropic superconducting compound.

29. A method for manufacturing a superconducting cabled conductor according to claim 23 including the further step of insulating the strands.

30. A method for manufacturing a superconducting cabled conductor according to claim 25 wherein the superconducting ceramic is micaceous or semi-micaceous.

31. A method for manufacturing a superconducting cabled conductor according to claim 22 wherein the orthogonal texturing step includes non-axisymmetric deformation texturing with a primary component of the force tensor directed orthogonal to the widest longitudinal cross-section of the cabled intermediate.

32. A method for manufacturing a superconducting cabled conductor according to claim 31 wherein the superconducting ceramic is a member of the bismuth family of oxide superconductors.

33. A method for manufacturing a superconducting cabled conductor according to claim 31 wherein the superconducting ceramic is a member of the thallium family of oxide superconductors.

34. A method for manufacturing a superconducting cabled conductor according to claim 25 wherein the superconducting ceramic is a member of the rare earth family of oxide superconductors.

35. A method for manufacturing a superconducting cabled conductor according to claim 22 wherein the orthogonal texturing step includes a magnetic alignment step with a primary aligning force orthogonal to the widest longitudinal cross-section of the cabled intermediate.

36. A method for manufacturing a superconducting cabled conductor according to claim 22 wherein the orthogonal texturing step includes a melt-texturing step with the primary temperature gradient orthogonal to the widest longitudinal cross-section of the cabled intermediate.

37. A method for manufacturing a superconducting cabled conductor according to claim 22 wherein the desired superconducting compound requires biaxial texture and the texturing step includes application of a texturing process with a second primary component in a predetermined direction in the plane of the widest longitudinal cross-section of the cabled conductor.

38. A method for manufacturing a superconducting cabled conductor comprising the steps of:

first, forming a plurality of composite strands, each strand comprising at least one twisted filament having a preselected filament cross-section and twist pitch, surrounded or supported by a matrix material and containing grains of the precursors to a desired member of the bismuth family of superconducting oxides;

second, forming a cabled intermediate from the strands by transposing them about the longitudinal axis of the conductor at a preselected strand lay pitch, the strand lay pitch, filament cross-section and filament twist pitch being cooperatively selected to provide a filament transposition area which is always at least thirty times the preferred direction area of a typical grain of the desired superconducting oxide;

and, texturing the strands in one or more steps including at least one orthogonal texturing step which includes non-axisymmetric deformation texturing with a primary component of the force tensor directed orthogonal to the widest longitudinal cross-section of the cabled intermediate, and at least one thermomechanical processing step at conditions sufficient to produce phase transformation in the filament material, at least one

such orthogonal texturing step occurring subsequent to said strand transposition step; thereby forming a superconducting cabled conductor having a crystallographic grain alignment substantially independent of the rotational orientation of the strands and filaments in the cabled conductor.

39. A method according to claim 38 further including one or more heat treatment steps at conditions chosen to provide crack healing in the filament material but not to melt the matrix material.

40. A method for manufacturing a superconducting cabled conductor according to claim 38 wherein the filaments are twisted and the filament cross-section, filament twist pitch, and strand lay pitch are cooperatively selected so that at each point on the filament, regardless of how it is twisted, the filament width in the plane of the widest longitudinal cross-section of the conductor is always greater than, and preferably twice as large as the filament height orthogonal to the widest longitudinal cross-section of the conductor.

41. A method for manufacturing a superconducting cabled conductor according to claim 38 wherein the orthogonal texturing step further comprises a magnetic alignment step.

42. A method for manufacturing a superconducting cabled conductor according to claim 38 wherein the superconducting ceramic is BSCCO 2212.

43. A method for manufacturing a superconducting cabled conductor according to claim 38 wherein the superconducting ceramic is BSCCO 2223.

The cable lay pitch was set by a capstan take-up speed relative to the rotations speed to be nominally 1.03 inch. After cabling, the material was heat treated at 760 C for 2 hr. in 0.1 atm of oxygen. The cable was then rolled to at thickness of 0.0157 inch and heat treated for 6 hr. at 827 C in 7.5 % oxygen in nitrogen atmosphere. The cable was finally turks head rolled to 0.0126 inch in thickness. A final heat treatment of 40 hr. at 827 C, 30 hr. at 808 C, and 30 hr. at 748 C, all in 0.075 atm of oxygen in nitrogen was employed. The Je at 77K (B=0) was 2996 A/cm^2 at a fill factor of nominally 25 % superconductor cross section. The voltage/current characteristics of the sample in 0 magnetic field are shown in Exhibit 1.

EXAMPLE 2

A 91 filament composite was made with an approximately a hexagonal array filament pattern as described in Example 1 above. In this example, the multifilament composite was further drawn to nominally 0.028 inch diameter and turk-headed or drawn through a square die to 0.0245 inch on a side. The square cross section composite was annealed in air at 300C for nominally 10 minutes. The material was divided approximately equally into 8 parts and each was layer wound onto a cabling spool.

An 8 strand Rutherford cable is made from 91 filament composite strand. A "ferris wheel" cabling configuration is used, where the spools' orientation in space is fixed as it rotates around the axis of the cabler, similar to a seat on a ferris wheel. The tension on each strand is controlled by magnetic breaks and set to nominally 0.5 inch-pounds. The width and thickness of the cable were set by a non-powered turks-head to be 0.096 and 0.048 inch, respectively. The strands enter the turks-head with the sides of the square cross section maintained parallel to the sides of the resulting rectangular cable. The cable lay pitch is set by a capstan take-up speed relative to the rotations speed to be nominally 1.03 inch. After cabling, the material is heat treated at 760 C for 2 hr. in 0.1 atm of oxygen. The cable is then rolled to at thickness of 0.0157 inch in a single pass. The cable is then heat treated for 6 hr. at 827 C in 7.5 % oxygen in nitrogen atmosphere. The cable is finally rolled to 0.0145 inch in thickness in a single pass. A final heat treatment of 40 hr. at 827 C, 30 hr. at 808 C, and 30 hr. at 748 C, all in 0.075 atm of oxygen in nitrogen is employed. The Je at 77K (B=0) is 2280 A/cm^2 at a fill factor of nominally 20 % superconductor cross section.

The various features and advantages of the invention may be seen from the foregoing description and examples. Iterative variations on the processes described above, such as changes in the materials, the number and type of texturing steps, and the

cabling styles and equipment used will be seen to be within the scope of the invention. Many modifications and variations in the preferred embodiments illustrated will undoubtedly occur to those versed in the art, as will various other features and advantages not specifically enumerated, all of which may be achieved without departing from the spirit and scope of the invention as defined by the following claims.